DOCUMENT RESUME

ED 212 877 CE 031 420

AUTHOR Legacy, Jim; And Others
TITLE Planting Turf. Competency Based Teaching Materials in Horticulture.
INSTITUTION Illinois State Board of Education, Springfield. Dept. of Adult, Vocational and Technical Education.; Southern Illinois Univ., Carbondale, Dept. of Agricultural Education and Mechanization.
PUB DATE [80]
NOTE 42p.; For related documents see CE 031 413-421.
AVAILABLE FROM Agricultural Education & Mechanization Dept., Southern Illinois University, Carbondale, IL 62901 ($3.00).

EDRS PRICE MF01/PC02 Plus Postage.
DESCRIPTORS *Agricultural Education; Check Lists; Competency Based Education; Horticulture; Job Skills; Learning Activities; Ornamental Horticulture; *Ornamental Horticulture Occupations; Secondary Education; Tests; *Turf Management; Units of Study; Visual Aids

ABSTRACT

This competency-based curriculum unit on planting turf is one of four developed for classroom use in teaching the turf and lawn services area of horticulture. The eight sections are each divided into teaching content (in a question-and-answer format) and student skills that outline steps and factors for consideration. Topics covered include preparing soil bed area, planting turfgrasses, lawn establishment by seed, stolonizing and sprigging, plugging, sodding, rolling newly established turf, and caring for a newly established lawn. A list of references precedes a section containing visual aids, student skill checklist, and student activities, such as handouts, discussion activities, field trips, crossword puzzles, hands-on experiences, worksheets, tests, and quizzes. Answer keys are provided. (YLB)

****
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
****

U.S. DEPARTMENT OF EDUCATION
NATIONAL INSTITUTE OF EDUCATION
EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

☑ This document has been reproduced as received from the person or organization originating it.

☐ Minor changes have been made to improve reproduction quality.

• Points of view or opinions stated in this document do not necessarily represent official NIE position or policy.

"PERMISSION TO REPRODUCE THIS MATERIAL HAS BEEN GRANTED BY

F. Roneau

TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)."

ED212877

Planting Turf

Competency Based Teaching Materials in Horticulture

CE031420

Listed below are competency based curriculum units developed for classroom use in teaching horticulture. All units are indexed and include teaching content, references, student activities, a skill check list, and visual aids.

LANDSCAPE/NURSERY Tree Identification Developing a Landscape Plan Implementing the Landscape Plan Maintaining the Landscape Nursery Propagation	GREENHOUSE PRODUCTION & MANAGEMENT Controlling the Greenhouse Environment Greenhouse Soils Foliage Plants Propagation Sales Cut Flower Production Bedding Plants
TURF AND LAWN SERVICES Identification of Turf Grasses Soils and Fertilizers Planting Turf Grasses Insects and Diseases	VEGETABLE PRODUCTION Identification of Cool Season Vegetables Identification of Warm Season Vegetables Vegetable Production Insects, Diseases, and Weeds
FRUIT PRODUCTION (In progress)	

ACKNOWLEDGEMENT

This material was prepared by: Jim Legacy, Fred Reneau, Thomas Stitt, Terry Savko, Amy Swigart, Kathy Cummings, Carole Daesch, Sharon Flanagan, and 42 Illinois teachers of horticulture, in cooperation with the Illinois State Board of Education, Department of Adult, Vocational and Technical Education, and the Department of Agricultural Education and Mechanization, Southern Illinois University.

PLANTING TURFGRASSES

Contents

PREPARING SOIL BED AREA 1

Test soil, drainage requirements, nutrient requirements, site grade, site preparation, common turf insects and diseases, weed control, soil amendments

PLANTING TURFGRASSES 7

Spring/fall seeding, growth habits of turfgrass varieties, characteristics of cool season/warm season turfgrasses, advantages/disadvantages of cool season/warm season turfgrasses, seed quality, plug and sprig quality, select desired variety for site

LAWN ESTABLISHMENT BY SEED 9

Seed selection, seeding rates, seeders, seed planting

STOLONIZING AND SPRIGGING 10

Sprigging, topdressing

PLUGGING 11

Turf selection, planting time, uses

SODDING 12

Site preparation, soil amendments, water requirements, sod characteristics, order sod, installation, follow-up care

ROLL NEWLY ESTABLISHED TURF 14

Purpose of rolling, weight used

CARE FOR A NEWLY ESTABLISHED LAWN 16

Water requirements, types of irrigation, weed control, insect control, mowing heights of cool season/warm season varieties, fertilizer requirements, rates of fertilizer applications

REFERENCES 21

STUDENT ACTIVITIES 22

Planting Turfgrasses

PREPARING SOIL BED AREA

Teaching content: 35 questions; 4 student skills

Question 1 Who tests soil?

- Extension service
- Private soil testing laboratory

Question 2 What will a soil test review?

- Present nutrient levels
- pH
- Soil texture
- Recommendations

Question 3 Should I have my soil tested?

Alternatives	Factors for Consideration
1. No soil test nor application of lime or fertilizer to area specified	- Could yield less than desired results
2. Guess-apply a little of everything	- Further unbalance lawn area
3. Test soil	- Eliminate problems, helps insure success

Student Skill 1

TEST SOIL

Steps	Factors for Consideration
1. Contact soil testing agent for forms	1. Use clean non-metal bucket
2. Collect soil sample	2. Soil to be tested should represent soil from 15-20 spots in any one sampling area
3. Place about a pint of soil in a plastic bag, label it, and send it to the soil testing lab	3. Take samples to a depth of 6-7"
	4. Record where each sample was taken

Question 4 What type of debris needs to be removed?

- Rotting wood
- Stones
- Cement

Question 5 Why should rocks and debris be removed?

- Buried debris can lead to stress from severe heat and drought stress
- Decaying leaves undesirable depressions
- Provides favorable location for diseases and insects

Question 6 How deep should rocks and debris be removed?

- All material 1/2" or larger should be removed from the top 4" of soil.
- All material 2" and larger should be removed from the top 12" of soil.

Question 7 What do I use for grading points?

- House foundation
- Sidewalks
- Driveways
- Trees

Question 8 What is the ideal grade?

- 1-2% away from house

Question 9 What materials should be used in subgrading?

- Good fill soil that is free from debris, insects and weeds.

Question 10 How much fill should be used?

- Generally enough to bring the grade up to within 6-8" of the desired level.

Question 11 How much top soil should be added to the subfill?

- At least 6-8" or more is needed to level the lawn to the desired grade.

Question 12 What is surface drainage?

- Surface drainage is providing proper slope and contouring to provide rapid and efficient surface removal of water.

Question 13 How much slope should be used?

- Not less than 1% grade sloping away from the house but more can be used to develop an aesthetically pleasing effect.

Question 14 When should subsurface drainage be used?

- In poorly drained soils
- Where surface drainage is not practical
- For low areas and depressions

Question 15 What soil type is desired for lawns?

- 8-12" of sandy loam soil is preferred.

Question 16 What can be added to top soil to make it more desirable for plant materials?

- Organic matter
- Gypsum

Question 17 What elements or nutrients should be added to the soil?

- Limestone based on a soil test to raise pH.
- Sulfur to lower pH
- Nitrogen, phosphorous, potassium at the rate of 1-2 lbs. each per 1000 sq. ft. of area (12-12-12)

Question 18 How should these materials be incorporated?

- The added materials should be rototilled or worked into the top 6-8" of top soil.

Question 19 What are the characteristics of a well-prepared soil?

- It should be moist, granular, firm, free of clods, stones and other debris.

Question 20 When should the soil be prepared?

- Within 24 hours of planting if possible

Question 21 What equipment should be used?

- A high speed rototiller followed by rolling and a light raking will generally provide a good seed bed.

Student Skill 2

DETERMINE PERCENT ROUGH GRADE FOR SITE

Steps	Factors for Consideration
1. Set up transit and sighting rod	1. Be sure transit is leveled correctly
2. Take reading	
3. Do mathematical calculations to determine percentage of slope	

Question 22 What types of erosion are present in lawns?

- Water
- Wind

Question 23 How can water erosion be controlled?

- Reduce the speed of surface drainage
- Mulch seed bed after planting

Question 24 How can wind erosion be controlled?

- Keep surface moist by watering
- Reduce wind velocity by using portable screens

Student Skill 3

PREPARE SITE

Steps	Factors for Consideration
1. Remove rocks and debris	1. Anything larger than 1/2" in top 4" of soil and larger than 2" in top 12" should be removed
2. Rough grade lawn	2. Shape subsurface to desired contour 6-8" lower than desired finished grade
3. Provide for surface or subsurface drainage	3. Slope lawn at least 1% away from house where possible. Provide tile if not possible
4. Modify soil	4. Add limestone to raise pH to 6.5-7.0. Add 2 lbs. each of nitrogen, phosphorous and potash per 1000 sq. ft.
5. Cultivate top soil	5. Incorporate nutrients and amendments into top soil and work top 4-6" to a fine granular texture. Roll top soil lightly to level and rake lightly.
6. Control erosion	6. Mulch if necessary to control water erosion. Screen and water to prevent wind erosion.

Question 25 What are the major insects which attack turfgrasses?

- Root-feeding
  - Grubs
  - Billbugs
  - Mole crickets
- Shoot feeding
  - Sod webworm
  - Cutworms
  - Chinch bugs
  - Aphids

(refer to Turf Management by Turgeon, pages 259-269)

Question 26 What are some common weeds found in lawns?

- Dandelion
- Buckhorn
- Yellow rocket
- Chick weed
- Clover
- Purslone
- Spurge
- Crabgrass
- Goose grass
- Wild garlic
- Plantain
- Heal-all
- Thistle
- Block media
- Ground ivy
- Oxalis
- Coarse fescue
- Knot weed
- Fox tail
- Shepard's purse

Question 27 How can lawn weeds be controlled?

- Establish and maintain a healthy turf, which includes a yearly fertilization program
- Water appropriately
- Use good seed variety
- Maintain proper soil pH
- Use herbicides

Question 28 What methods of weed control can be used?

- Pre-emergence herbicide
- Post-emergent selective contact herbicide
- Best control is healthy, thick turf which keeps weed seeds from contact with soil thereby preventing germination

Question 29 How soon can seeding or sodding be done?

- In most cases 30 days
- New products on the market such as siduron allows immediate seeding or sodding

Student Skill 4

CONTROL PERSISTANT WEEDS

Steps	Factors for Consideration
1. Read label carefully on container	1. Follow directions exactly
2. Make application	2. Wear protective clothing
3. Do not seed or sod until chemicals have dissipated	3. Destroy empty container properly
	4. Wash hands

Question 30 How do I know if I need soil amendments?

- By the amount of clay present in the soil (the more clay the greater the need for amendments. Incorporate them thoroughly).

Question 31 What are some of the soil amendments I can choose from?

- Peat moss
- Composted sawdust
- Sand
- Humus
- Top soil

Question 32 How do I know what to add to soil?

- Interpret soil test

Question 33 How do I add necessary materials?

- Use broadcast spreader and incorporate them 6-8" into soil with tiller.

Question 34 How long can I wait to seed or sod after final grading?

- Seed or sod immediately so seed bed is not ruined.

Question 35 What are key points to remember when final grading?

- Get area as level as possible
- Maintain 1-2% slope away from house
- Remove foreign matter

PLANTING TURFGRASSES

Teaching content: 12 questions; 1 student skill

Question 1 What are the advantages of spring seeding?

- Adequate rainfall can be expected
- Plenty of sun and warm temperatures aid in germination

Question 2 What are the advantages of fall seeding?

- Soil is warm, encouraging rapid germination
- Adequate rainfall can be expected
- The warm soil and cool air temperatures encourage good root formation as less plant energy is exerted to top growth

Question 3 What precautions must be taken for summer planting?

- Water often and thoroughly to keep ground cool and moist
- Don't mow newly established stand of turf too low--only 1/3 of blade at most per mowing with a height of 2" or more during summer months

Question 4 What environmental factors affect the growth habit of turfgrass varieties?

- Full sun
- Partial shade
- Full shade
- Amount of moisture
- Amount of air movement

Question 5 What are the characteristics of cool season turfgrasses?

- Day temperatures of 60-75°F for favorable growth
- Moist, neutral to slightly acid soils
- 4-6# N per 1000 ft^2/year
- Mowing height of 1 1/2-2"
- Sunny to slightly shaded sites

Question 6 What are the disadvantages of cool season turfgrasses?

- Goes dormant in higher summer temperatures
- Requires supplemental irrigation during drouth periods

Question 7 What are characteristics of warm season turfgrasses?

- Day temperatures of 80-95°F for favorable growth
- Adapted to wide range of soil conditions
- Quite tolerant of heat and drouth
- Not tolerant of shade
- Mowing height of 1/2-1" preferred (Bermudagrass/Zoysiagrass), 1 1/2-2 1/2" for St. Augustinegrass
- Rapid establishment through use of plugs or sprigs
- Withstands foot traffic very well

Question 8 What are the disadvantages of warm season turfgrasses?

- Thatch build-up can be a problem
- Turns brown (yellow) early in fall due to colder temperatures and later green-up in spring than for cool season varieties
- Tends to be an active spreader into flower beds

Question 9 How can seed quality affect the selection of a variety?

- Seed purity
- Seed germination
- Seed labeling
- Seed certification

Question 10 How can sprig quality affect selection?

- Sprig freshness
- Sprig purity

Question 11 How can plug quality affect the selection?

- Plug freshness
- Plug purity

Student Skill 1

SELECT VARIETY

Steps	Factors for Consideration
1. Determine type of turfgrass to plant	1. Cool season for northern areas; warm season for southern areas
2. Select variety	2. Likes and desires, environmental conditions
3. Determine method of planting	3. Seed, sprig, plug
	4. Cost

Question 12 What should I ask about the different varieties of grass seed when making the selection?

- Strengths
- Weaknesses
- Shade tolerance
- Water needs
- Fertilizer needs
- Wearability
- Mowing height
- Where best adapted for
- Inert materials
- % germination

LAWN ESTABLISHMENT BY SEED

Teaching content: 8 questions; 1 student skill

Question 1 Should I buy seed?

Alternatives	Factors for Consideration
1. Seed	- Wider range of varieties are available as seed - Starting from seed is less expensive
2. Sod	- Sod provides instant lawn

Question 2 What type of seed should I buy?

Alternatives	Factors for Consideration
1. Straight	- Gives uniform lawn in color and texture - One variety could be easily wiped out by disease
2. Blend	- Blend combines strengths
3. Mixture	- Mixtures have best adaptability overall - Cheapest way to establish turf

Question 3 What determines the seeding rate?

- Turfgrass species
- % germination and purity of seed
- Germinating conditions
- Establishment rate desired

Question 4 What rate of seed per variety?

	Area per #	# per 1000 ft^2
- Kentucky bluegrass	200-300 ft^2	3.5-5#/1000 ft^2
- Bentgrass	250-300 ft^2	3.5-4#/1000 ft^2
- Creeping Red Fescue	200-250 ft^2	4-5#/1000 ft^2
- Tall Fescue (K-31)	125 ft^2	8#/1000 ft^2
- Perennial Ryegrass	100-150 ft^2	7-10#/1000 ft^2
- Annual Ryegrass	250 ft^2	4#/1000 ft^2
- Sunny Mix Bluegrass 50% Red Fescue 25% Bentgrass 12% Redtop 12%	200-300 ft^2	3.5-5#/1000 ft^2
- Shady Mix Red Fescue 50% Rough Bluegrass 50%	250-300 ft^2	3.5-4#/1000 ft^2

Question 5 How much seed should I buy?

- Determine square footage of area to be seeded
- Calculate need based on recommended rate per 1000 sq. ft.

Question 6 What types of seeders are available?

- Gravity
- Centrifugal
- Cultipacker
- Hydroseeder

Question 7 How deep should the seed be planted?

- Usually 2-4" below the surface will be most favorable for rapid germination

Question 8 How can seed be covered?

- Controlled rolling or firming will improve germination because of the increased seed-soil contact for imbibition of water by seed

Student Skill 1

SEED LAWN AREA

Steps	Factors for Consideration
1. Carefully rake and level seed bed	1. Seed in 2 different directions
2. Sow seed	
3. Lightly rake seed in and roll	
4. Add mulch	4. Use weed free mulch
5. Water thoroughly	5. Water to a depth of 6"

STOLONIZING AND SPRIGGING

Teaching content: 5 questions; 1 student skill

Question 1 What is stolonizing?

- Stolonizing is vegetative propagation by broadcasting stolons over prepared soil. They are then topdressed and press-rolled. It is common procedure in bentgrass and bermudagrass.

Question 2 What is meant by topdressing turf?

- A prepared soil mix is added to the surface of a turf and worked in by raking and/or irrigating for the purpose of firming the turf by working soil in among stolons and thatch-forming materials. Also used for enhancing thatch decomposition and covering stolons or sprigs during vegetative planting.

Question 3 What is sprigging?

- Sprigging is similar to stolonizing except the stolons are planted in small furrows or holes; primarily done with Zoysia/Bermudagrass.

Question 4 Why is sprigging necessary for certain varieties of grass?

- Because they don't produce viable seed
- Faster to cover lawn area

Question 5 What turf varieties are sprigged?

- Warm season grasses only

Student Skill 1

SPRIG NEW LAWN AREA

Steps	Factors for Consideration
1. Prepare lawn area	1. Keep sprigs cool, moist, and out of sun until planting time
2. Plant individual sprigs at spaced intervals 4-12" in furrow with furrows spaced 4-12" apart	
3. Fill furrows and roll lightly, topdress at regular intervals	3. Topdressing material should be similar to the underlying soil
4. Water thoroughly	

PLUGGING

Teaching content: 5 questions; 1 student skill

Question 1 What is plugging?

- Plugging is the vegetative propagation of turfgrasses by means of plugs or small pieces of sod which are planted at regular intervals.

Question 2 How is plugging done?

- 2-4" diameter plugs of sod
- Place plugs 12-18" apart on center

Question 3 What kinds of turf can be plugged?

- Warm season grasses only--most commonly used for propagating Zoysiagrass
- Topdressing seldom used with plugging except on bentgrass or Bermudagrass greens

Question 4 When is the best time to plug a lawn?

- Early spring--in order to have a maximum period of warm temperatures for rapid turfgrass establishment

Question 5 When is plugging used?

- To repair damaged areas
- For initial establishment of certain varieties of turf

Student Skill 1

PLUG NEW LAWN

Steps	Factors for Consideration
1. Prepare lawn area	1. The shorter the distance between plugs, the quicker turf is established
2. Plant plugs on 6-12" centers	2. Topdressing may be necessary later to level lawn
3. Area should be rolled to firm soil around plugs	3. Helps to provide favorable moisture relations
4. Water thoroughly	

SODDING

Teaching content: 11 questions; 2 student skills

Question 1 How should site be prepared for sodding?

- Prepare similar to seeding
- Ensure adequate soil moisture level prior to planting

Question 2 Do I need to improve the soil if I buy sod?

Alternatives	Factors for Consideration
1. Use soil as is 2. Add amendments	- The better your soil is before establishment of lawn, the easier it will be to take care of in the future

Question 3 Why is watering important prior to planting?

- Insures adequate soil moisture
- Causes maximum rooting rate
- Reduces transplant shock

Question 4 How much water is required prior to planting?

- On sandy loam soil generally wet soil 1-2" deep
- Lighter soils require more water

Question 5 What characteristics are desired in high quality sod?

- Uniformity
- High shoot density
- Adequate strength for harvesting and handling
- Freedom from weeds, insects, diseases and nematodes
- Acceptable color
- Sufficient maturity in terms of carbohydrate reserves to permit effective rooting
- Minimum thatch layer
- Variety adapted to area

Question 6 How often must sod be watered?

- Daily; water to a depth of 6"

Question 7 How does one determine how much sod to order?

- Measure length and width of area to be sodded and divide by 9; this answer is the number of square yards to order

Student Skill 1

HARVEST SOD

Steps	Factors for Consideration
1. Check for proper quality	1. Sod will be of no better quality than when harvested
2. Obtain equipment	2. Sod cutter
3. Cut sod	3. Make sure to get a uniform root mass of sufficient thickness to hold together
4. Roll sod	4. Generally 1 sq. yd./roll
5. Store in cool place and keep moist	5. Prevents drying out and dying 6. Do not keep cut sod for extended period of time

Question 8 How soon must sod be installed after delivery?

- As soon as possible. Be sure and keep sod moist.

Question 9 How should sod be laid?

- Unroll and nestle one against the other. Place strips in staggered position
- Firm into place and fill voids with weed-free soil
- Roll to firm and mask strips tightly against each other

Question 10 How should water be applied after sod is laid?

- Water to a depth of 4-6"
- Roll with medium weight roller

Student Skill 2

TRANSPLANT SOD

Steps	Factors for Consideration
1. Prepare site	1. Same as for seeding
2. Obtain materials	2. Sod, water sprinkler, roller, knife
3. Lay sod	3. Tight joints in an overlapping pattern
4. Fill in voids	4. Prevents holes
5. Water sod	5. Soak about 6" deep
6. Roll sod	6. Knit pieces together and to underlying soil

Question 11 What follow-up care or attention is needed?

- Water thoroughly as needed for 2-4 weeks or until sod has firmly knitted to soil bed
- After establishment, handle as any newly seeded lawn

ROLL NEWLY ESTABLISHED TURF

Teaching content: 8 questions; 1 student skill

Question 1 Are there other advantages to rolling a lawn?

- Eliminates air pockets
- In the case of sodding, it helps seams knit better
- Reduces erosion problems on seed beds

Question 2 When should a new lawn be rolled?

- Immediately after seeding or sodding

Question 3 Why are new plantings rolled?

- To prevent drying out of roots
- To put more moisture in contact with roots and seeds

Question 4 How much weight should be placed in a roller?

- Cloddy soils and sandy soils require more than wet heavy soils
- Drier soils require more than wet soils

Question 5 How heavy a roller should be used?

- 250-350 lb.

Question 6 How deep should soil be compacted after rolling?

- New seeding should be compacted about 1/4-1/2" below seed to surface
- Sod should be compacted to knit strips together and to soil bed

Question 7 What types of soils require more rolling?

- As cloddishness increases, rolling is more effective
- Do not roll heavy soils when they are very wet

Question 8 How is aeration reduced by rolling?

- By pressing soil particles closer together and by breaking up clods into smaller structure

Student Skill 1

ROLL SODDED AREA

Steps	Factors for Consideration
1. Obtain equipment	1. Sprinkler, water and roller
2. Water about 6" deep	2. Soak sod and underlying soil
3. Fill roller with water	3. Added weight will help press sod and soil
4. Roll sod or seed bed	4. Reduces air content in soil and slows drying

CARE FOR A NEWLY ESTABLISHED LAWN

Teaching content: 23 questions; 4 student skills

Question 1 How often should a new lawn be watered?

- Daily for first 30 days, then twice a week for 30 days, then once a week.

Question 2 What are some factors that can affect watering requirements?

- Type of soil
- Type of grass
- Weather
- Wind

Question 3 How deep must a lawn be watered?

- 6-8" (equivalent to a 1-2" rainfall)

Question 4 What time of day should lawn be watered?

- Water whenever the lawn needs it

Question 5 What determines the need for irrigation?

- Temperature
- Humidity
- Air movement
- Susceptibility of variety to drought

Question 6 What types of irrigation can be used on turf?

- Sprinkler type irrigation
- Surface flooding
- Subsurface irrigation

Question 7 What are the essential features of sprinkler irrigation?

- Adequate water supply
- Suitable means of providing pressure
- Water transmission lines of adequate capacity
- Efficient equipment for distribution

Student Skill 1

IRRIGATE SITE

Steps	Factors for Consideration
1. Determine if additional water is needed	1. Wet to depth of 4-6" or 1/2" below seed or root mass
2. Select method	2. Sprinkler, subsurface or flooding
3. Obtain materials	3. Equipment, hose, water supply
4. Irrigate lawn	4. As outlined in step 1
5. Put away equipment	

Question 8 How can lawn weeds be controlled in a newly established lawn?

- Water adequately
- Mow to correct height
- Use good seed
- Maintain proper pH
- Fertilize during growing season
- Maintain thick stands of grass

Question 9 How do I keep a healthy lawn?

- Mow at right height
- Fertilize adequately
- Good watering practice

Question 10 How soon can the new lawn be treated with a herbicide?

- After the fourth mowing

Question 11 What should be used?

- Selective contact broadleaf herbicide
- Following spring use a weed grass post-emergence preventer herbicide

Student Skill 2

CONTROL WEEDS AND INSECTS

Steps	Factors for Consideration
1. Determine problem	1. Only use if problem exists
2. Select method	2. Use chemicals only if necessary
3. Treat needed area	3. Spot treat before widespread problem develops

Question 12 How soon should a new lawn be mowed?

- As soon as it is high enough (2")
- Allow soil to dry before mowing to minimize damage

Question 13 How often should new lawn be mowed?

- Mow when grass grows to 1/2-1/3 taller than its recommended mowing height.

Question 14 What type of mower should be used?

Alternatives	Factors for Consideration
1. Reel 2. Rotary 3. Flail	- Adjustable mowing height - Safety - Type of grass to be mowed - Height of lawn area to be mowed

Question 15 What are the correct mowing heights for cool season and warm season grasses?

- Bermuda or Zoysia should be cut between 3/4 and 1"
- Bluegrass and Fescue should be cut 1 1/2 inches high in spring and 2 1/3-3" during summer

Question 16 How much grass should be removed at each mowing?

- Not more than 1/3 of the total height at each mowing
- When more than this is removed, the grass may be shocked and clipping disposal may be a problem

Student Skill 3

INITIAL MOWING

Steps	Factors for Consideration
1. Measure height	1. Mow warm season grasses when they get 1 1/2" high; cool season grasses when they get to 2"
2. Get mower	2. Use correct type, preferably push mower for first mowing
3. Start mower	3. Be sure to wear safety glasses when operating
4. Mow grass	4. Watch wheel marks and foot prints so they do not tear up turf
5. Put away mower	5. Be sure to clean mower and check blade for sharpness for next mowing

Question 17 What are the most important nutrients for a lawn?

- Nitrogen--growth and color
- Phosphorous--root growth
- Potassium--wearability and disease resistance

Question 18 What is a complete fertilizer?

- One that contains nitrogen, phosphorous, and potassium (potash)

Question 19 What is the most important nutrient for my new lawn?

- Phosphorous--root development

Question 20 How often should a new lawn be fertilized?

- Four times a year at evenly spaced intervals between April and October (usually 6-8 weeks apart)
- A yearly rate of 2-4 lb. of N/1000 sq. ft. should be applied during the course of the growing season.

Question 21 How much fertilizer should be applied to fescue and bluegrass?

- 1 1/2 lb. of nitrogen in spring and fall and 2 1/2-3 lb. nitrogen in summer
- 2-3 lb. of phosphorous and potash during growing season

Question 22 How much fertilizer should be applied to Bentgrass?

- 2-3 lb. of potassium and potash/1000 sq. ft. annually
- Nitrogen should be applied at rate of 2-6 lb./1000 sq. ft. annually.

Student Skill 4

FERTILIZE POST-GERMINATION

Steps	Factors for Consideration
1. Determine needs	1. Soil test
2. Fertilize in spring	2. 1 1/2 lb. N, 1 lb. P_2O_5, 1 lb. K and 0/1000 sq. ft.
3. Fertilize in summer	3. 2 1/2-3 lb. N/1000 sq. ft.
4. Fertilize in fall	4. Same as spring
5. Obtain material	5. Fertilizer and equipment
6. Weigh out fertilizer	6. To get proper amount for area
7. Fill spreader and calibrate	7. Do this on driveway or some surface not in turf
8. Spread 1/2 fertilizer in each direction	8. Prevents over-fertilization or skils
9. Clean equipment	9. Wash with plenty of water to prevent rusting
10. Put away equipment	

Question 23 What should be discussed with customers to eliminate future misunderstandings?

- Work and material guarantee
- Potential problems that may arise
- Best time of day to contact you

REFERENCES

Beard, James B. Turfgrass: Science and Culture. Englewood Cliffs, N.J.: Prentice-Hall, Inc., 1973.

Crockett, James U. and the Editors of Time-Life Books. Lawns and Ground Covers (2nd Edition). New York: Time-Life Books, 1975.

Ingels, Jack E. LANDSCAPING: Principles and Practices. Albany, N.Y.: Delmar Publishers, 1978.

Pennsylvania State University. Turfgrass Identification. University Park, PA: Pennsylvania State University. (slide set/script)

Pennsylvania State University. Types of Turf. University Park, PA: Pennsylvania State University. (slide set/script)

Reiley, H. E., and C. Shry, Jr. Introductory Horticulture. Albany, N.Y.: Delmar Publishers, 1979.

Science and Education Administration. Better Lawns--Establishment, Maintenance, Renovation, Lawn Problems, Grasses (Revised). Washington, D.C.: U.S. Government Printing Office, 1979. Home and Garden Bulletin Number 51.

Turgeon, A. J. Turfgrass Management. Reston, VA: Reston Publishing Company, Inc., 1980.

Turgeon, A.J., and Floyd Giles. Turfgrasses of Illinois. Urbana, IL: Cooperative Extension Service, 1975. Circular Number 1105.

STUDENT ACTIVITIES

PLANTING TURFGRASSES
Definitions

Alkaline soil - soil whose reaction is above pH of 7.0

Cool-season turfgrass - Turfgrass species adapted to favorable growth during the cool portions (60-75°F) of the growing season; may become dormant or injured during the hot weather.

Herbicide - A pesticide used for controlling weeds.

Mixture - Combination of 2 or more species.

Overseed - To seed onto an existing turf to provide active grass growth during the dormancy of the original turf - usually a cool-season grass over a warm season grass.

Pegging sod - Use of small stakes to hold sod in place until transplant rooting occurs; normally used on slopes and waterways.

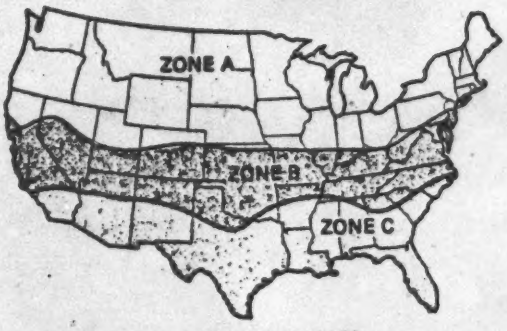
pH - A numerical measure of the acidity of a soil; a pH of 7 indicates neutrality while above 7 is basic and below 7 is acidic.

Plug - To propagate turfgrasses vegetatively by means of plugs or small pieces of sod.

Sodding - Propagation of turfgrass vegetatively through the use of sod.

Sprigging - Vegetative planting by placing stolons, rhizomes, or tillers in furrows or small holes.

Warm-season turfgrass - Turfgrass species adapted to favorable growth during warm portions (80-95°F) of the growing season.

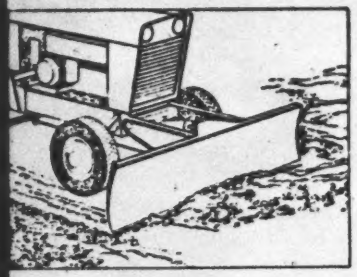


ZONE A—COOL SEASON GRASSES
ZONE B—WARM OR COOL SEASON GRASSES
ZONE C—WARM SEASON GRASSES

Suggested grass varieties
for the establishment of permanent lawns

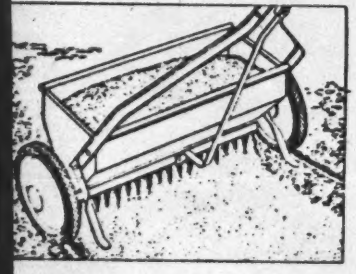
ZONE A	ZONE B	ZONE C
Kentucky Bluegrass	* Warmer Areas *	Bermudagrass
Creeping Bentgrass	Bermudagrass	Zoysiagrass
Red Fescue	Zoysiagrass	St. Augustinegrass
	* Cooler Areas *	
	Kentucky Bluegrass	
	Creeping Bentgrass	
	Fine Fescue	

ESTABLISHING A LAWN

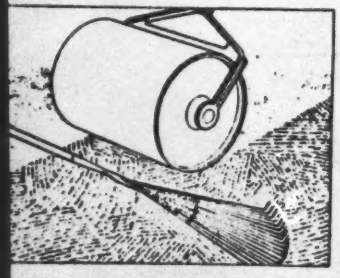


1. Good drainage is a must. Slope soil away from homesite in all directions, if possible. Spread soil evenly over area - eliminate high spots where mower blade might scalp turf. Fill in low spots where water collects or a mower cannot evenly mow.

2. Loosen soil with tiller. Pea-size lumps should remain to catch the tiny grass seeds. Rocks and debris should be removed before incorporating lime or gypsum into the seedbed. Lightly grade soil once more before wetting it to firm soil into place.



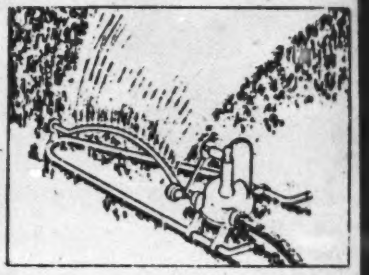
3. Spread grass seeds with seeder, preferably the rotary type. For better coverage, it is best to apply seeds in two directions. Seeding rate varies with the grass varieties - consult chart for proper rate. Do not over-seed as seedlings need room for root and leaf development.



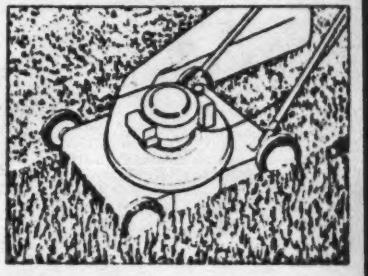
4. Lightly rake seeds into seedbed being careful not to bury seeds. Roll area once with empty roller to assure seed contact with soil. Seeds must have light to germinate

5. A starter fertilizer is applied to the soil bed prior to the seeding. Grass seed contains enough nurishment for germination, but added nutrients are necessary for further seed growth.

6. Keep newly planted area moist for 2 weeks or until the turf is well established. Avoid light waterings as moisture must penetrate the soil 4-6" deep. Sprinklers should be set to cover entire area without having to be moved as this disturbs plant growth.



7. Grass should be mowed when $2\frac{1}{2}$" Do not mow shorter than 2" the first year as this aids in shoot growth and root development. Clippings may be removed to prevent disease problems. They are an organic source of N but may also cause a thatch build-up.



8. Weeds will appear in the new turf. All soils contain weed seeds but many will die off after weekly mowing begins. 'Weed and Feed' fertilizer may be used the second year as well as the use of early spring pre-emergent controls (Dacthal).

MANAGEMENT PRACTICES THAT HELP PREVENT LAWN DISEASES

These practices are general guides to be used according to one's judgment. Their importance depends on the kind and seriousness of the disease threat. Not all of them are practicable under all conditions.

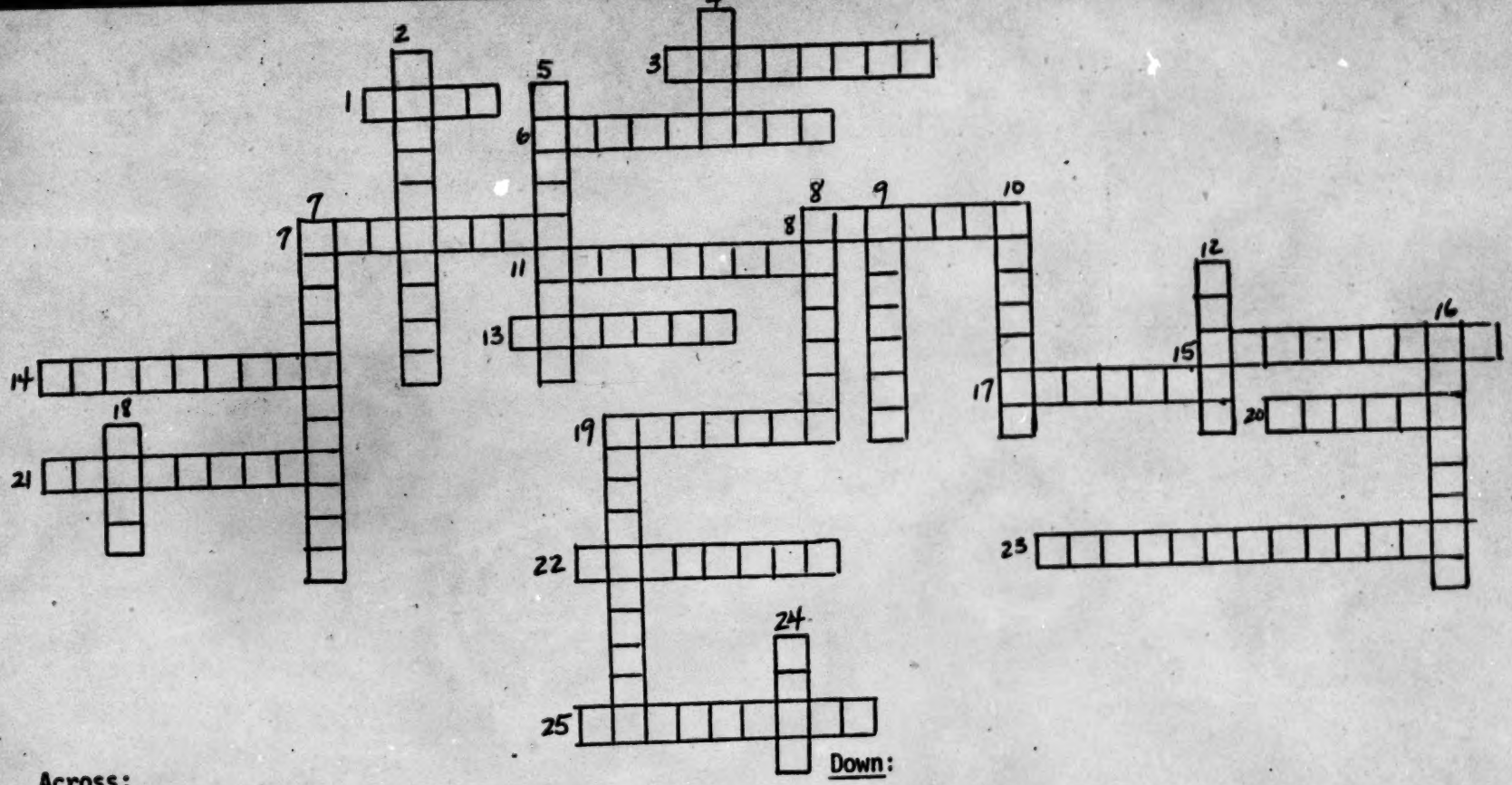
- Select grass species best adapted to the soil, climatic, and light conditions under which they will be grown.
- Plant mixtures of recommended grasses. Species vary in their susceptibility to different disease organisms, and in a mixture one or more of the grasses usually will survive a severe disease attack.
- Do not clip upright-growing grasses such as Kentucky bluegrass and red fescue too closely—1¾ to 2 inches is the best height. Creeping grasses such as bentgrass and zoysia may be clipped at ½ inch or less.
- Mow the grass before it gets too tall; not more than one-half of the leaf surface should be removed at one time.
- Mow the lawn frequently enough in the fall to prevent the accumulation of a thick mat of grass before snow comes.
- Apply enough fertilizer to keep grass vigorously growing, but avoid overstimulating the grass with nitrogen. Apply lime if soil tests indicate a need for it.
- Clippings need not be removed except on heavily fertilized lawns or during periods when the grass is growing rapidly. Clippings provide nutrients for fungi and help to maintain humidity long after the sun has dried off surrounding uncovered areas.
- Water early enough in the day to allow grass leaves time to dry out before night. Avoid frequent, light waterings, especially during warm weather.
- Do not water grass until it begins to wilt, then soak the soil to a depth of 6 inches or more. Provide good surface drainage.

..... Science and Education Administration. Lawn Diseases - How to Control Them (Revised). Washington, D.C.: U.S. Government Printing Office, Home and Garden Bulletin 61, 1979.

STUDENT SKILL CHECKLIST

Planting Turfgrasses

	Max. Score	Your Score
Preparation steps before seeding:		
1. Soil tested for present nutrient levels	5	
2. Rocks and debris removed	5	
3. Rough grade the lawn	5	
4. Necessary subsurface drainage installed	10	
5. Modify the soil	5	
6. Cultivate the topsoil	10	
7. Steps taken to control erosion	10	
Selection of proper seed:		
8. Variety chosen according to season	10	
Seed the lawn area:		
9. Rake and level seed bed	10	
10. Rake seed in and roll	10	
11. Add mulch	10	
12. Water thoroughly	10	
Total Score	100	

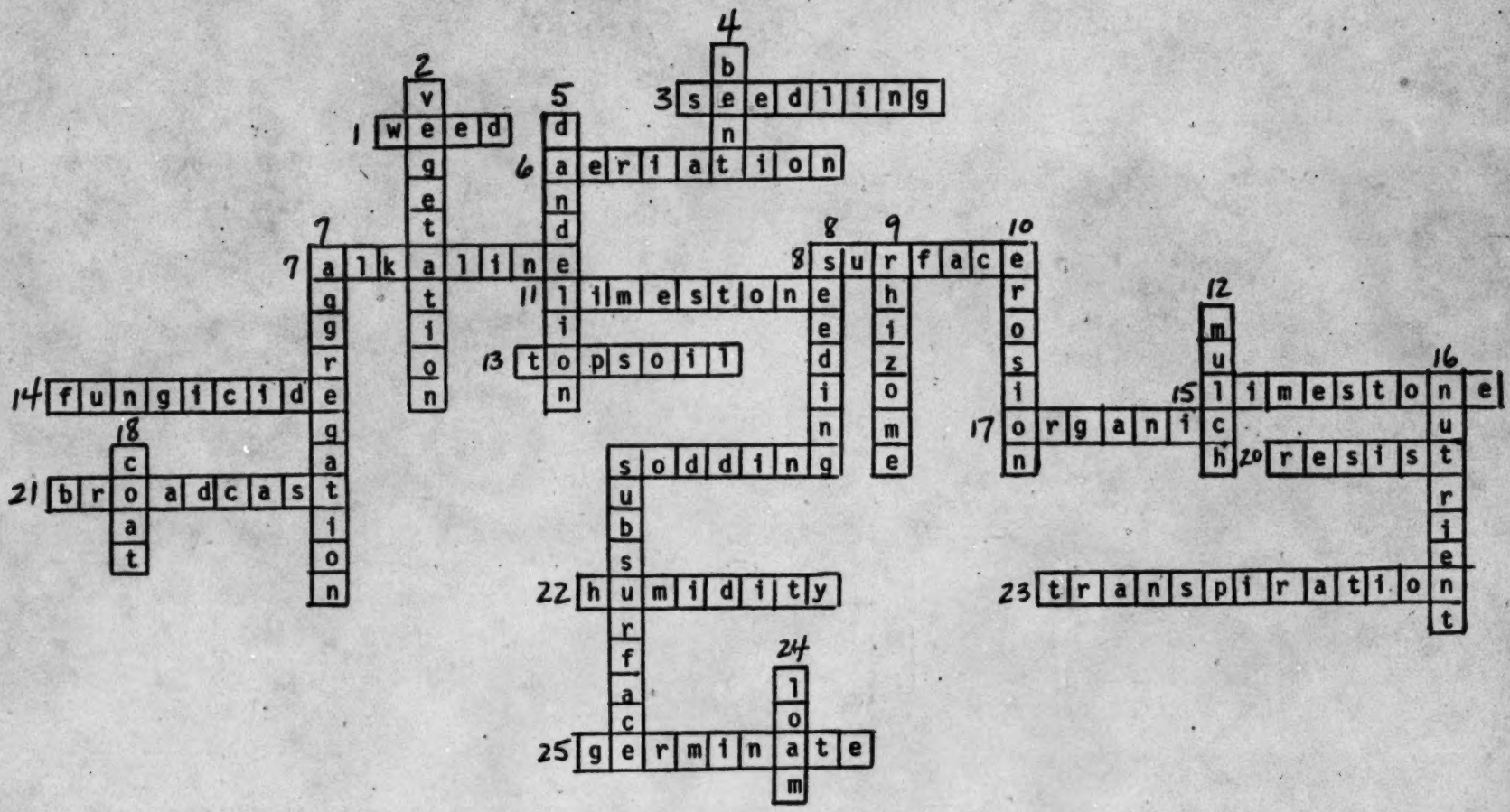


Across:

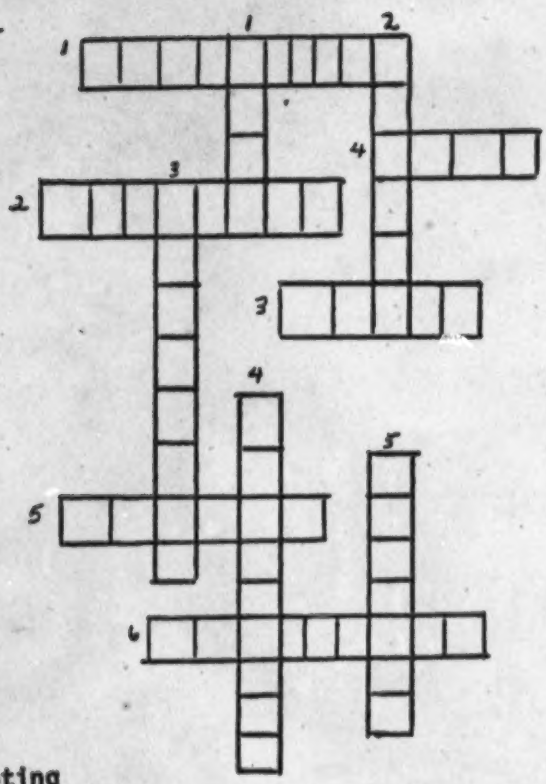
1. Any plant growing where it is not wanted
3. Young plant which has been germinating several days
6. Movement of air through the soil
7. Soil with pH above 7.0
8. Above-soil drainage
11. Natural rock used to reduce soil acidity
13. Surface soil
14. A substance which destroys or prevents the growth of fungi
15. Used to lower pH
17. Dead and decaying plant and animal material
19. Carpet-like method of propagation
20. To withstand or prevent
21. To spread over an entire area
22. The amount of moisture in the atmosphere
23. Loss of water through a leaf or stem
24. To sprout or begin to grow

Down:

2. Method of propagation other than seed
4. Type of grass used on golf greens
5. Common lawn weed
7. The clinging together of soil particles to form a crumb-like particle
8. Method of propagating lawns
9. Underground stem which produces roots
10. Washing or blowing away of soil caused by water or strong winds
12. Any material used to cover the soil for weed control and moisture retention
16. Plant food element
18. Seed _____, the outer covering of the seed
19. Tile drainage
24. Soil with approximately equal amounts of sand, silt, and clay


1 weed
2 vegetation
3 seedling
4 bud
5 dormancy
6 aeration
7 alkaline
8 surface
9 horizon
10 erosion
11 limestone
12 mulch
13 topsoil
14 fungicide
15 limestone
16 nutrient
17 organic
18 catch
20 resist
21 broadcast
22 humidity
23 transpiration
24 loam
25 germinate

Crossword



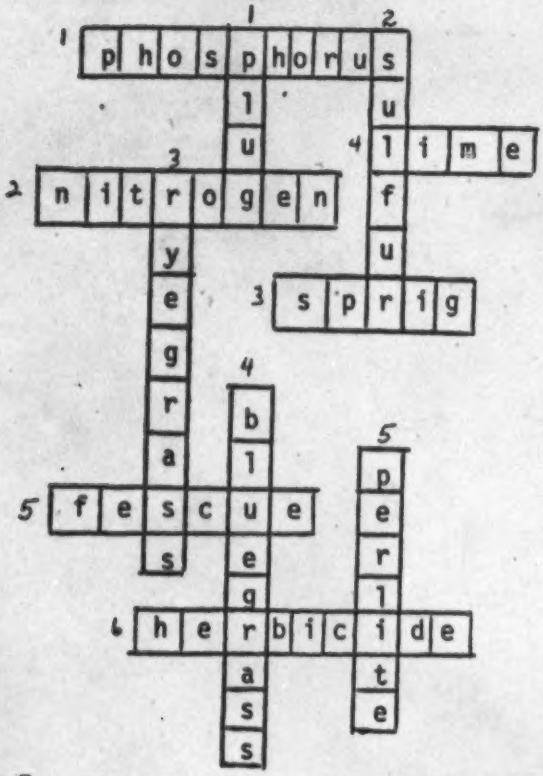
Across:

1. Important for rooting
2. Gives plants their deep green color
3. Used to propagate grasses that don't produce viable seed
4. Used to counter the acidity
5. Grass for shady areas
6. Used to kill weeds

Down:

1. Method of establishing a lawn
2. Used to counter the alkalinity
3. Fast germinating grass
4. Most popular grass in northern areas
5. Volcanic soil amendment

Crossword

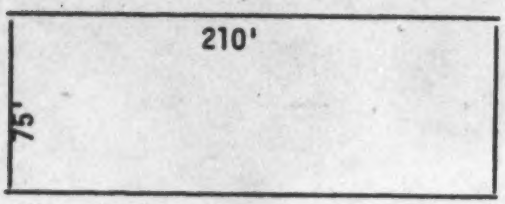

1 phosphorus
2 nitrogen
3 sprig
4 lime
5 fescue
6 herbicide
1 2
3
4
5
6

PLANTING TURF GRASSES

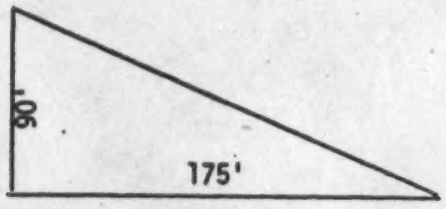
Worksheet

1. Figure the total square feet in each of the following examples:

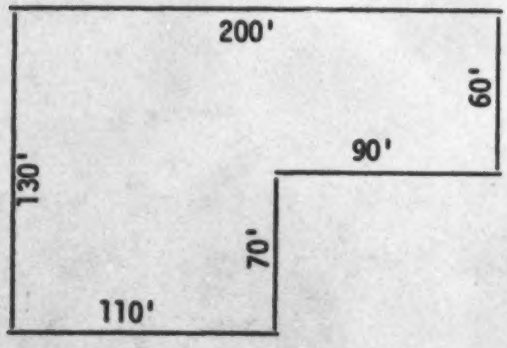
a.



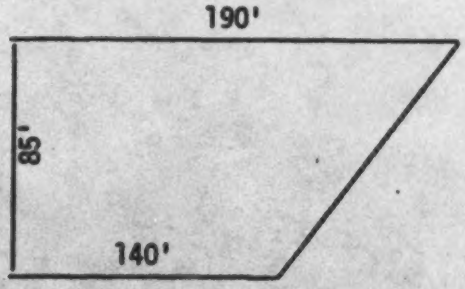
b.



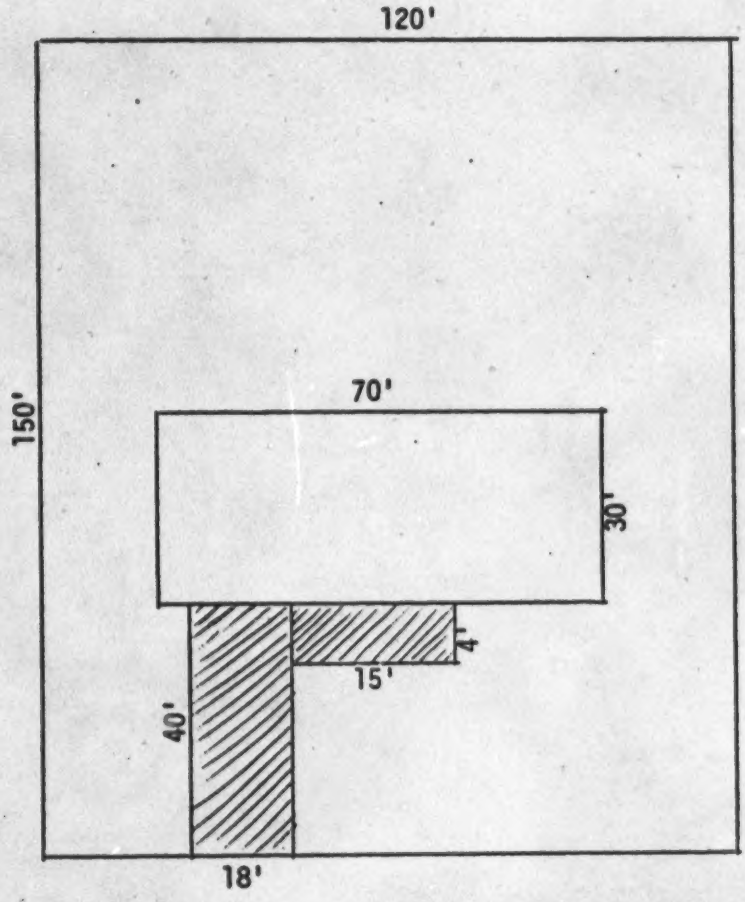
c.



d.



2. Figure how many square yards of sod would be needed for the following residence:



3. Using the residence in problem 2, figure how much seed would be needed to seed the lawn at the rate of 5# of seed per 1000 sq. ft.

PLANTING TURF GRASSES

Quiz

Matching

____ 1. A major lawn insect
____ 2. A variety of cool season grass
____ 3. Control for erosion
____ 4. A common lawn weed
____ 5. Used in subsurface drainage
____ 6. Seeding rate
____ 7. Lawn slope is established
____ 8. Planting depth
____ 9. Raises soil pH
____ 10. Plugging

A. limestone
B. mulching
C. buckhorn
D. Kentucky bluegrass
E. rough grading
F. Japanese beetles
G. tile
H. .2-.4"
I. 1-2 lbs/1000 sq.ft.
J. vegetative propagation

Fill in the blank

1. The three most important nutrients to a good lawn are: a) nitrogen b) phosphorus c) potassium.
2. A measure of the acidity or alkalinity of the soil is known as a pH test.
3. When grading a yard the percent of slope should be 1-2% away from the house.
4. List three soil amendments:
   a) peat moss b) perlite c) sand
5. The best times of the year to seed a lawn are autumn & spring.
6. At what height should grass grow to before being mowed for the first time? 2"
7. What are the two types of mowers? a) reel b) rotary

PLANTING TURFGRASS

Quiz

1. What three things will a soil test determine?

   present nutrient levels

   pH

   soil texture

2. List three types of debris to be removed from the soil during seedbed preparation.

   rotting wood stones cement

3. How much slope away from the house should be used?

   not less than 1%

4. When is subsurface drainage used?

   in poorly drained soil

   where surface drainage is impractical

   for low areas and depressions

5. What characteristics are maintained in a well-prepared soil?

   moist, granular, firm, free of clods and stones

6. When preparing the site for planting turfgrass, certain steps must be carried out. Renumber these given steps into the correct order.

   ____ A. Modify soil
   ____ B. Rough grade the lawn
   ____ C. Remove rocks and debris
   ____ D. Control erosion
   ____ E. Cultivate topsoil
   ____ F. Provide for surface or subsurface drainage

7. List some common weeds found in lawns.

   Dandelion, Clover, Plantain, Thistle, Oxalis, Knotweed, Foxtail